

Investigation of Contaminant Fate and Transport Beneath Leaked Hanford High-Level Waste Tanks

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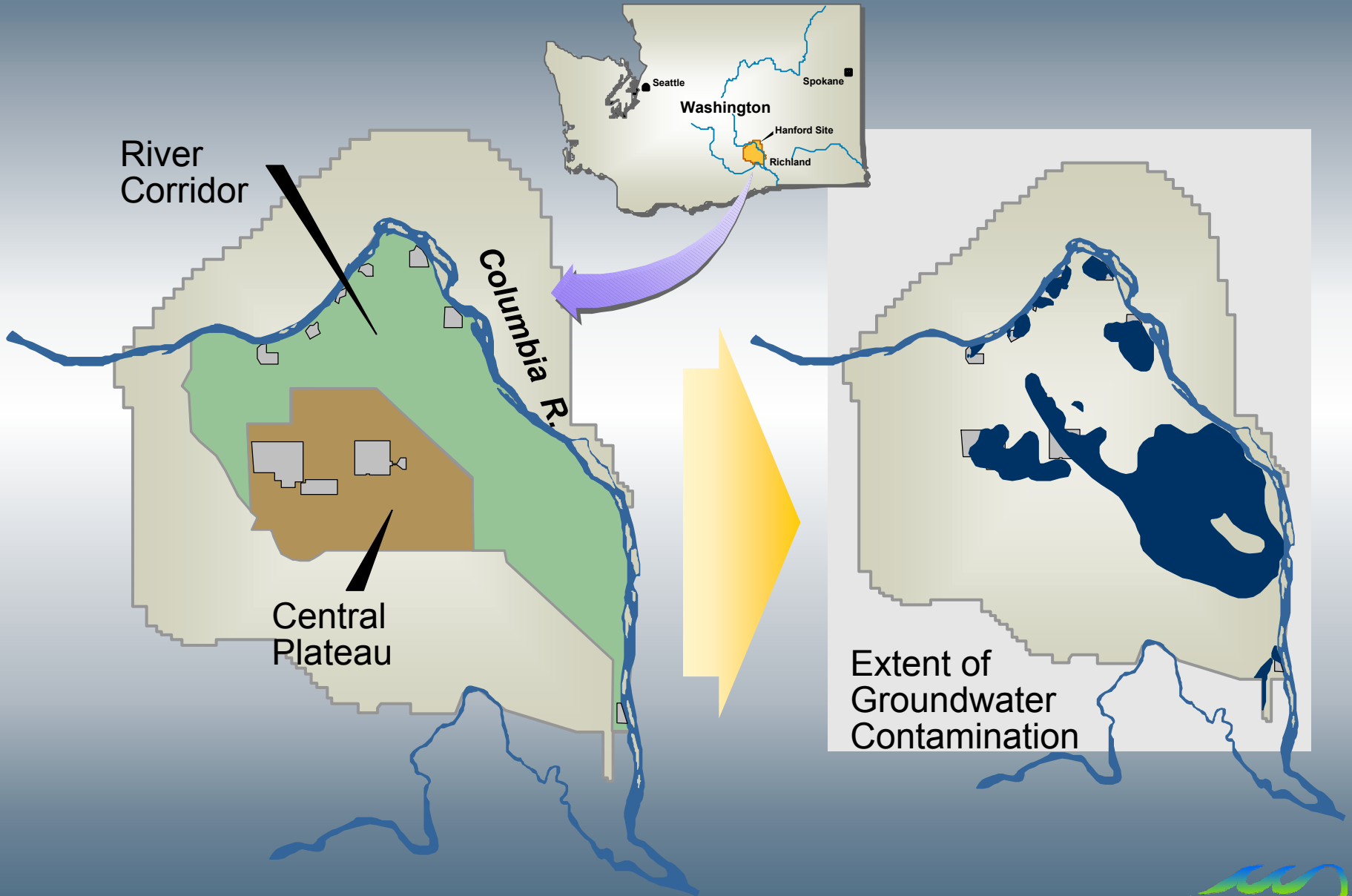
Fluor Hanford

GROUNDWATER
PROTECTION PROGRAM

Topics

- Hanford Groundwater Protection Program
- Science and Technology Project
- Scientific Investigations of Tank Farm Issues
- Lessons Learned

Hanford Site



Groundwater Protection Program Approach

- Focused on cleanup of legacy wastes
- Emphasis on protecting groundwater resources
- Science and Technology a key program element

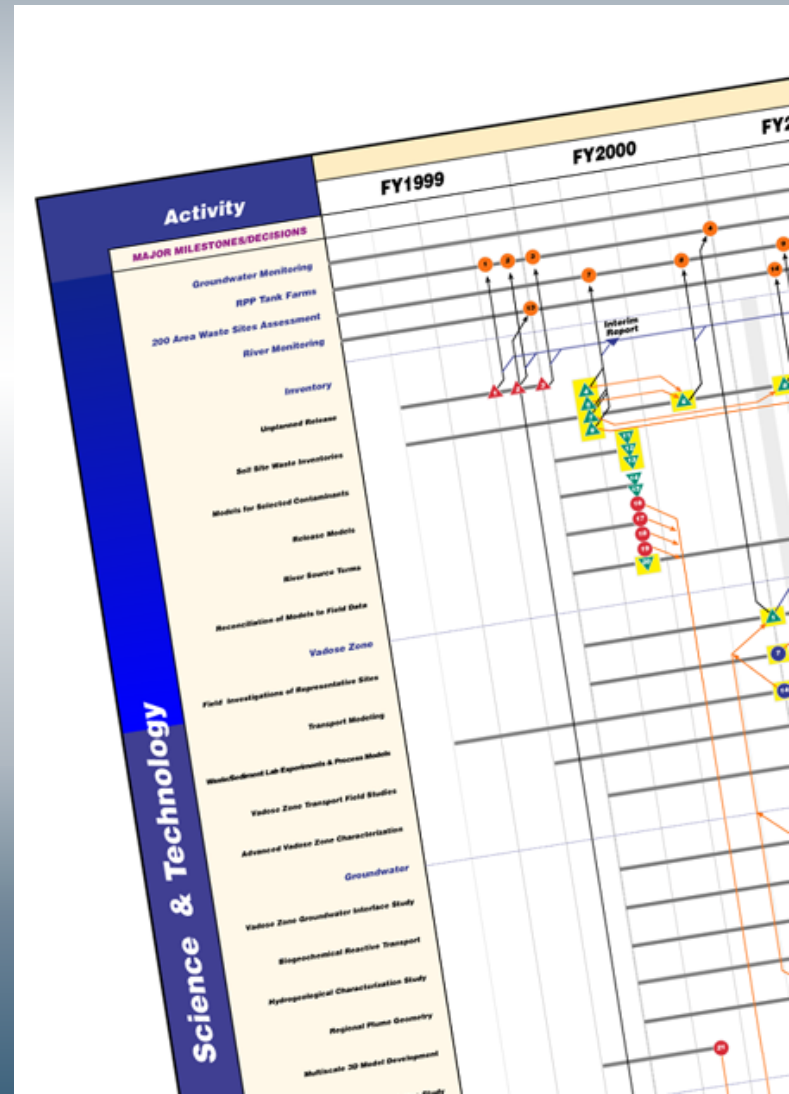


*Inform and Influence
Cleanup Decisions*



Science and Technology Roadmap

- Hanford community engaged in development of roadmap
- Roadmap is a tool for defining and managing science and technology investments
- Science community involved through Groundwater Protection Program and DOE Environmental Management Science Program



Tank Farm Investigations

Regulatory-driven studies of past leaks from Hanford high-level waste tanks including:

- Implementation of field activities to collect new data
- Understanding of the nature and extent of past releases and predicting future impacts
- Recommendations for corrective actions



Objectives

- Resolve key issues associated with leaks from high-level waste tanks
- Establish improved conceptual models for processes controlling contaminant distribution and potential for future migration of contaminants
- Impact decisions for interim corrective actions and longer-term tank-farm closure

Scientific Problem Sets

► S-SX Tank Farms

- Cesium-137 and chromium migration and attenuation
- Thermal history and impacts
- High salt and high base effects



► B-BX-BY Tank Farms

- Uranium chemistry and migration
- Strontium-90 chemistry and migration
- Lateral spreading of leaked wastes

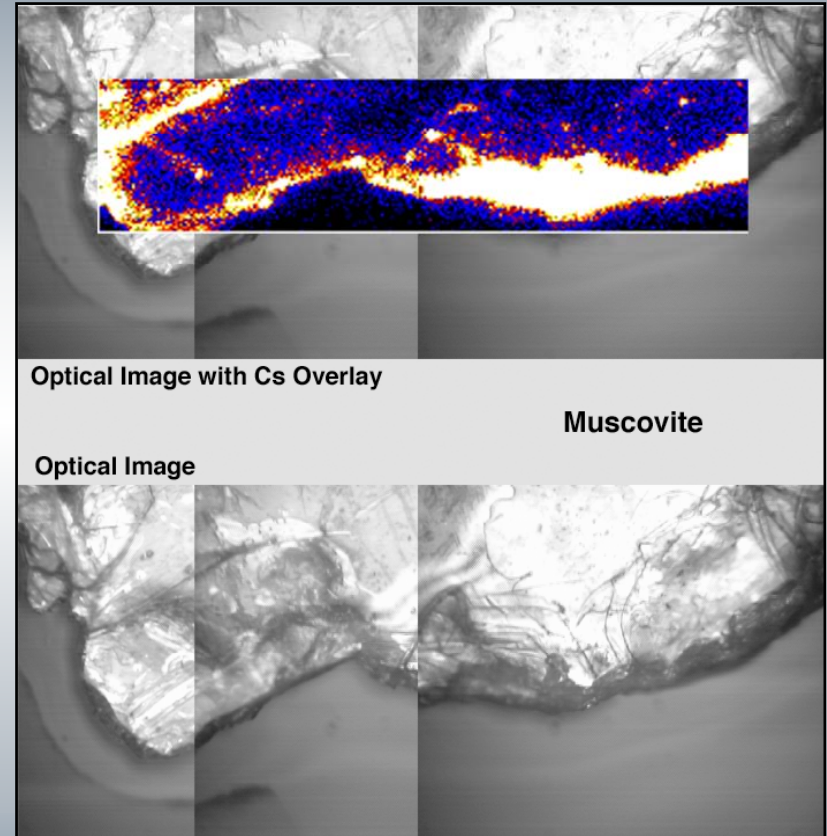
Project Approach

- Performed focused laboratory investigations of contaminants associated with the tank farms
- Applied detailed numerical models with new data
- Included contributions from the DOE Environmental Management Science Program (EMSP)



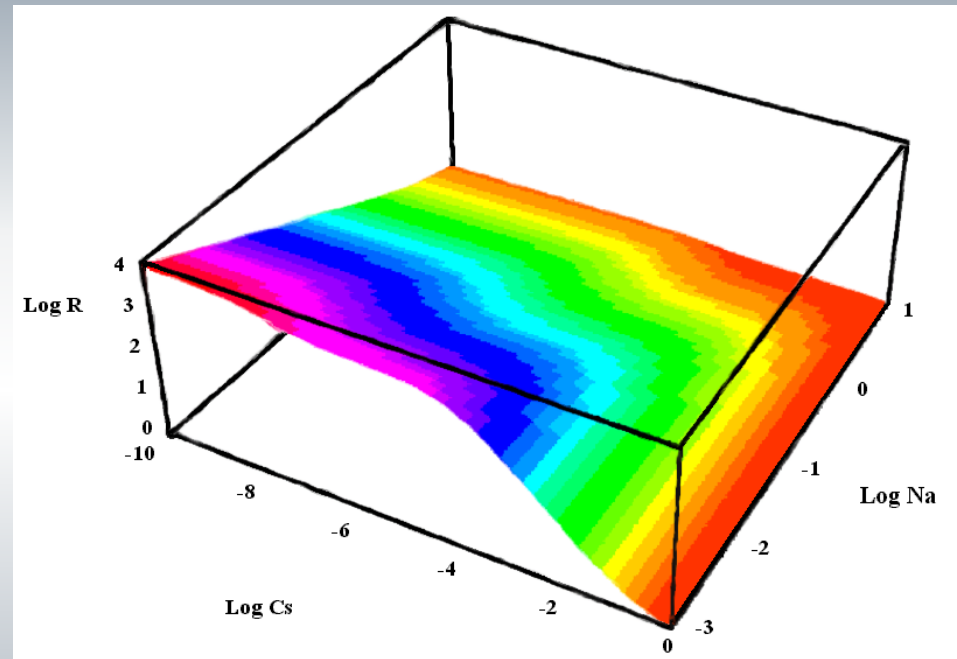
Scientific Contributions

- ✓ Resolved long-standing issues and apparent anomalies (e.g. expedited cesium-137 migration)



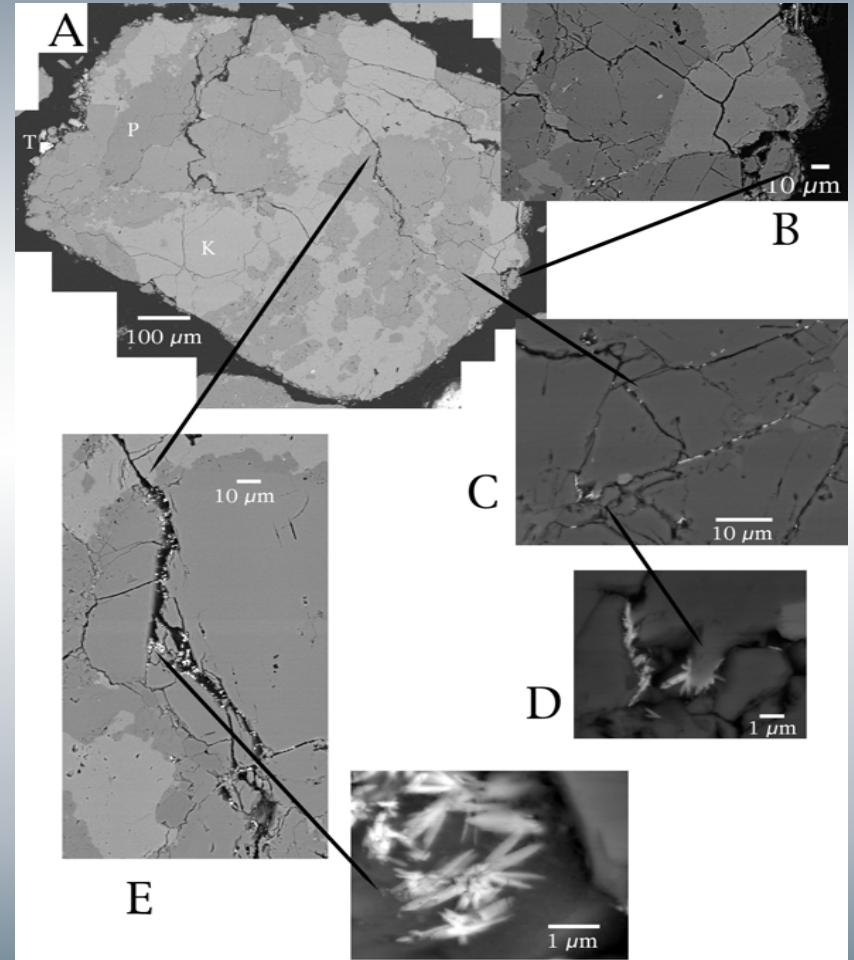
Scientific Contributions (cont.)

- ✓ Advanced basic understanding of soil-contaminant interactions to improve model predictions



Scientific Contributions (Cont.)

- ✓ Improved understanding of uranium, chromium, and strontium-90 migration
- ✓ Made direct contributions to milestones – Tank Farm Field Investigation Reports



Lessons Learned

- Fundamental and applied research can help cleanup in resolution of key technical uncertainties and supporting defensible decisions
- Research must be on target, relevance alone is insufficient
- Continued dialogue is key and a partnership with site remediation contractor is required for success

Summary

- Science and Technology Project is an integral part of Hanford cleanup
- Implementation challenges include:
 - Contributing science input to compliance-driven project schedules
 - Identifying the critical cleanup decisions and issues

